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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Playing Porpoise

See page 356

A SCIENCE SERVICE PUBLICATION

## Kodak reports to laboratories on:

what's available in microreproduction . . . copy negatives on a film with a peculiar H & D curve . . . our costliest last-minute addition

### Fear not the paper mountains

How most efficiently to store and retrieve records of fact, feeling, fancy, or thought set down by one human being for another to read at a subsequent time—this core problem we employ dozens of men to ponder. A few of their schemes are already in the hands of the fellows with the screwdrivers and square-wave generators. As the months and years go on, we hope you will hear more about these things. For the present, those who fear the paper mountains must trust in microfilm and its offshoot, the microprint card (the latter for objectors against a return of literature to the scroll format).

In numerous cities there are organizations with commercial motivation for being helpful in applying microreproduction to your own situation. One of these, Recordak Corporation, our subsidiary with offices at 415 Madison Avenue, New York 17, and branch offices in many other places, is the pioneer in working out routines for record-keeping through microfilm. Other organizations sell and service our Kodagraph apparatus for making or viewing microfilms in less specialized applications.

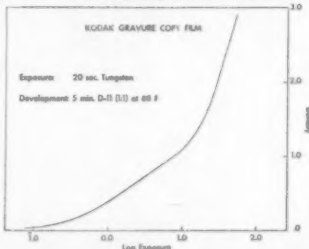
One such, University Microfilms, 313 North First Street, Ann Arbor, Mich., has set itself the task of microfilming a vast number of past and current periodicals from many fields and many nations, from the most scholarly to the lowbrow. They couch their advertising argument in terms of a quadratic equation in  $t$ , the time during which a periodical file is stored, and then in 15 pages of close-set type list all the periodicals which they sell in microfilm form. Prices are comparable with the cost of merely binding paper editions. Of the Augean labors in law and librarianship that made the list possible they say little. Perhaps if you write them, they will send you a copy.

Another of our microfilming deal-

ers, Micro Photo Inc., 4614 Prospect Avenue, Cleveland 3, Ohio, strives for eminence in the newspaper division of the microfilm domain. Their catalog, in addition to the New York *Herald Tribune*, the Las Vegas *Optic*, the Waukegan *Little Fort Porcupine* (March 12, 1845 through March 16, 1847), and some 800 other current and defunct titles, offers also the *Official Gazette of the U. S. Patent Office* in microfilm from 1930 to date.

For our own survey, "What's Available on Microprint Cards," or the name of the nearest microfilming dealer we recommend, write Eastman Kodak Company, Graphic Reproduction Division, Rochester 4, N. Y.

### Are YOUR highlights washed out?



Just as some fortunate people are able to turn the pages of a Brahms score and hear the lovely music in the mind, so also a few (perhaps not quite so fortunate) can look at this curve and say, "Yup, a good long straight-line portion and then, as you go to your higher densities, your contrast starts going higher and higher. That's funny. An H & D curve is supposed to have a shoulder. Where contrast falls off when you get past the straight-line part. This shoulder is inside out. Kodak Gravure Copy Film, eh? Ought to be good for making copy negatives from pictures where the highlights are washed out. You could get some of the old lost zip back. Why did they have to wait till now to come out with it?"

Because we didn't know how to make it properly till now, that's why. If you're so anxious, why don't you call up a Kodak dealer right now and order some?

### Actually a bargain

A month or two ago "Eastman Organic Chemicals, List No. 40" appeared and was sent or offered to all who feel a need for a list of some 3500 organic compounds available from a single source. Even as the type was being set, additions were being made. A few of these we were able to incorporate in a last-minute supplementary list. Let us, for fun, examine the most costly of these items, 2,4-Dimethylbenzoic Acid (Eastman 7262) at \$3.55 for one gram.

This is actually a bargain. Anybody who has use for more than one gram of it knows a secret that we don't know. We are speaking, then, not of \$1600 per pound but of the sum of \$3.55. \$3.55 is less than it costs a chemist's employer to have him walk down to the library, fire up his pipe, exchange a few observations on school district politics with a colleague, and consult a few books which help him decide to get hold of some really pure m-xylene (where?), treat it with acetyl chloride in the presence of ferric chloride to convert to 2,4-dimethylacetophenone (assume he realizes that aluminum chloride suggested in some of the books sends the methyl groups skittering around the ring), and finally convert the acetyl substituent to a carboxyl by splitting it with sodium hypochlorite in a haloform reaction. For \$3.55 we not only do all this but stand prepared to defend the thesis that 2,4-Dimethylbenzoic Acid is what was in the bottle when we sealed it.

If this makes sense and you haven't as yet received your copy of "Eastman Organic Chemicals List No. 40," write Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company).

Price quoted is subject to change without notice.

**This is one of a series of reports on the many products and services with which the Eastman Kodak Company and its divisions are . . . serving laboratories everywhere**

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## BIOCHEMISTRY

# Trace Hormone Creation

How living things manufacture steroids is now fully understood for the first time, suggesting possibility of finding a blocking agent to interfere with cholesterol formation.

► THE CHEMICAL STEPS by which nature manufactures the steroids, one of the most important compounds in man, animals and plants, have been charted for the first time by a group of University of California scientists.

This is the third major class of compounds whose pathway of synthesis in living systems is now fully understood. The other two are the pathways for fats and carbohydrates.

The new work may expand man's knowledge of the human body and other biological systems as much as the earlier charting of the fat and carbohydrate biosynthetic pathways.

Already the research has touched off speculation that chemical blocking agents might be used to prevent the formation in the body of excess cholesterol, a widely distributed steroid associated with hardening of the arteries in man.

With the complete chemical cycle now known, it may be possible to find a blocking chemical that would interfere with a specific step in cholesterol formation much as sulfonamides interfere with infection.

In addition to cholesterol, other steroids in man include such chemicals as cortisone, sex hormones, and vitamin D. Digitalis, used to treat heart conditions, is an example of a steroid in plants.

The study shows that all the steroids, whether in plants or animals, evolve chemically in the same way, each steroid achieving its distinction by a slight last-minute differentiation in arrangement of outer atoms in a large parent molecule.

The cycle was clarified in six years of work by Dr. William G. Dauben, associate professor of chemistry, with the collaboration of John H. Richards, Thomas W. Hutten and Yoshio Ban.

Scientists have attempted to chart the steroid chemical pathway for 20 years, but the schemes suggested all failed.

In 1950, scientists in England and Switzerland noted a link between the steroids and a group of chemicals called triterpenes. This provided the clue that made it possible for Dr. Dauben to work out the complete pathway.

The scientists showed that steroid construction begins with acetate, a simple chemical unit widely distributed in plants and animals. In man, acetate is a common by-product of the body's burning of fatty acids contained in the diet.

The acetate is converted, in a series of steps, into isoprene-like compounds, a class of chemicals that form the basic units of rubber.

The isoprene is turned into squalene,

found first in shark liver 30 years ago and now known to be universally present in biological systems. Squalene is converted into a triterpene, which is turned into steroids.

Cholesterol has the same structure as a triterpene molecule except that it has lost three carbon atoms.

The chemical steps are achieved by chemical synthesis performed by specialized enzyme systems in plants and animals. Minor differences in the placement of carbon atoms on the edges of the large parent triterpene molecules make the difference between cholesterol, hormones and other steroids.

Dr. Dauben and his colleagues did their experiments by "feeding" acetate containing radioactive carbon 14 to living liver slices in test tubes, to yeast and to eucalyptus wood-rotting fungi.

The carbon 14 was traced from step to step, and in this way a picture of the biosynthetic cycle was built up.

Science News Letter, December 8, 1956

## ● RADIO

Saturday, Dec. 15, 1956, 1:45-2:00 p.m., EST  
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Morton Love, professor of agronomy, University of California College of Agriculture, Davis, Calif., will discuss "Grasses."

## ASTRONOMY

## Asteroid Comes "Close" to Mars

► A MINOR PLANET will come within about nine million miles of Mars next September, a Russian astronomer reported to the Cincinnati Observatory.

A close approach of an asteroid to a planet is a very rare event, and this is quite a "close" brush, astronomically speaking. Measurements made at that time can be used for determining the mass of Mars, now thought to be about a tenth that of earth's, since coming so close to a relatively large planet will affect the asteroid's motion.

The minor planet is Laodamia, and observations of it are urgently needed now and for the next ten years, during which it will make three quite close approaches, Dr. E. Rabe of the Cincinnati Observatory said.

The Russian who noted the event is Dr. V. A. Isvakov of the Institute of Theoretical Astronomy, Leningrad.

Science News Letter, December 8, 1956



**GEOPHYSICAL GLOBE**—Showing the world's terrain in three-dimensional relief, this globe, six feet in diameter, was on display at the National Academy of Sciences in Washington. Smaller and much less expensive are the 12-inch globes made of rigid plastic that can be separated at the equator for children to paint or draw on in the classroom. Douglas, Billy and Joan Harmon of Washington, D. C., are shown here with the globes and Kenneth Fagg, co-designer with Sam Berman, Geo-Physical Maps Inc., New York.

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**NATURAL RESOURCES****Shrimp Ground Found Near India**

➤ **FINDING** a rich shrimp area along India's southwest coast has led to the start of a shrimp trawling industry in the region and shrimp freezing for domestic and export trade.

A report from the United Nations Food and Agriculture Organization, Rome, says the shrimp ground was discovered by G. S. Illugason, an Icelandic fisherman working in Madras state.

Science News Letter, December 8, 1956

**MARINE BIOLOGY****Porpoise Plays With Football****See Front Cover**

➤ **ALGAE**, a trained porpoise at Marine Studios, Marineland, Fla., demonstrates in the photograph on the cover of this week's SCIENCE NEWS LETTER the skill with which he can catch objects.

The porpoise's ability to catch a football, in or out of the fall season, is surprising to visitors.

Science News Letter, December 8, 1956

# EXPERIMENTAL PSYCHOLOGY

by I. Pavlov



The publishers deem it a privilege to present, in this comprehensive anthology, the basic writings of the Russian physiologist and psychologist.

**FROM THE TABLE OF CONTENTS**

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## INVENTION

# Christmas-Use Devices

▶ WITH CHRISTMAS and the winter season both approaching, several patents issued by the Government recently are particularly appropriate.

To hold Mother's Christmas parcels as well as her money and other necessary items is a combination shopping bag and purse, roomy enough to serve as an overnight bag. Elizabeth Allean Ingram of Cincinnati, Ohio, received patent No. 2,771,112 for this carry-all with a secret compartment.

To help Dad clean off winter's snow, Joseph H. Jacobs of Minneapolis, Minn., has designed for sidewalk and driveway use a rotary snow plow that throws the snow with a shoveling action rather than blowing it. He claims the machine will remove crusted as well as extremely wet snow without clogging, and is easy to operate and maneuver. Mr. Jacobs was awarded patent No. 2,770,893, and assigned rights to the Jacobs Wind Electric Company, also of Minneapolis.

For Junior is the "inexpensive, yet useful and novel toy" made by adding wheels, axles, head, neck and tail to used tin cans after puncturing suitable openings. George L. Hicks of Prairie Village, Kans., claims his invention will provide manufacturers with an added inducement for people to purchase their merchandise, since the auxiliary parts needed to make the toy can be packaged to accompany the canned goods.

For the idea and a method of linking several such toys together, Mr. Hicks was granted patent No. 2,770,915, half rights to which he assigned to Roy E. Weinzel, Overland Park, Kans.

Teen-age girls who use nail polish may want to try the finger nail paint guard devised by Miriam J. Sawyer of Los Angeles, Calif., which was awarded patent No. 2,771,082. It consists of a circular disk made of a flexible material and having various-sized recesses along the rim. The disk is separated from the base by a compressible material. Downward pressure of the finger-nail when a finger is placed in the recessed space causes the disk to bend upward, thus pulling the flesh away from the edge of the nails to prevent any smearing of nail polish.

A Christmas tree stand that can be "quickly erected to supporting position by the very unskilled without use of tools other than the hands" has been devised by Carl W. Thom of Seattle, Wash. Most stands, he says, are either expensive or have too many parts for an amateur. Mr. Thom's stand is initially pressed out and cut as a blank from a single sheet of material, thus can be mass produced by conventional means. All parts required to support a Christmas tree firmly are provided by the single unit, for which Mr. Thom received patent No. 2,771,260.

Science News Letter, December 8, 1956



**DIET FOR BATS**—One of the vampire bats in a Cornell University research project gets part of his daily blood ration. Prof. William A. Wimsatt, left, and graduate assistant Frank C. Kallen, are trying to learn how bats can live on nothing but blood.

## ZOOLOGY

## Lizard Eye Pigments Clue to Evolution

▶ HOW GECKOS, a group of lizards, evolved from day-loving to night-loving creatures can be told through changes in the visual pigments of their eyes.

Dr. Frederick Crescitelli, zoologist at the University of California at Los Angeles, reports in the *Journal of General Physiology* that the primary pigment of visual chemistry in the nocturnal geckos is considerably different from that of other terrestrial animals, including rattlesnakes and alligators.

While well adapted to night vision, the geckos' visual chemistry is still partly suggestive of a creature of daytime activity.

From this pattern the following picture of evolution in the gecko is suggested. Eons ago, either for reasons of climatic changes or to escape predators that were thinning its ranks, the gecko, then active only by day, changed over to the "night shift."

In the course of evolution, visual chemistry adapted to daylight was transmuted to that required by night vision in association with the development of the secretive, nocturnal habit. Such a theory for the visual cells had been proposed by Dr. Gordon L. Walls, professor of optometry at the University of California, Berkeley, and this experimental evidence seems to support the theory from the chemical point of view.

The nature of visual pigments in geckos suggests the evolutionary process may still be going on.

Science News Letter, December 8, 1956

## MEDICINE

# Mental Illness Process

▶ THE MECHANISM of sudden death by anaphylactic shock, which sometimes hits allergy patients, and the process governing mental illness may be linked.

Evidence for this possibility comes from studies by Dr. Mary Alexander Fink of the University of Colorado Medical School. The findings were announced by the American Cancer Society, which supports Dr. Fink's research.

A body chemical called serotonin is 1,000 times more powerful than histamine in inducing the violent muscle contractions of anaphylactic shock in the mouse, Dr. Fink found.

Anaphylactic shock strikes when a person who has developed special sensitivity like an allergy to a substance, such as egg white or horse serum, gets another dose of the same substance. The shock can be fatal.

Serotonin is found in the brain, intestines and blood platelets. It stimulates voluntary muscle, including the muscles of artery walls, and may raise blood pressure and body temperature.

Some scientists believe serotonin acts as a switch connecting nerve pathways for the passage of stimuli to and from the brain. Some tranquilizing drugs have been reported to release serotonin from storage

depots to flood the system. Scientists have also reported that a drug bringing on symptoms of temporary insanity, LSD, short for lysergic acid diethylamide, blocks serotonin.

Dr. Fink has shown that a tiny trace of serotonin will produce shock reactions in mouse smooth muscle suspended in laboratory dishes, and that it takes 1,000 times as much histamine to produce a similar reaction.

She showed further that the reaction is completely abolished by adding to the tissue either the madness-inducing drug, LSD, or the tranquilizer, reserpine.

Implications of Dr. Fink's findings are given by the American Cancer Society as follows:

"They show that serotonin is probably the key substance in anaphylactic shock in the mouse. They confirm others' findings that reserpine and LSD act through serotonin. And they open the door to speculation as to the existence of a biological and chemical link between allergy and chronic mental disease."

Dr. Fink's findings are a by-product of her development of techniques for testing for the presence of anti-cancer antibodies in mice tissues.

Science News Letter, December 8, 1956

## AGRICULTURE

# Venezuela Fights Insects

Scientists in Venezuela believe education on use of insecticides will in time beat the insects, ignorance and interests they now fight in their battle to control ravenous pests.

By HOWARD SIMONS  
from Venezuela

► VENEZUELA'S battle against insect pests has also become a fight against the farmers' lack of education and commercial interests "out to turn a fast dollar."

The problems faced by scientists at the Government's Center for Agricultural Investigations, Maracay, Venezuela, are typical of those being faced by a major portion of the world today. Scientific developments are being dumped on laymen faster than instructions concerning how to use the developments can be given.

This is illustrated in the development and use of insecticides to rid Venezuela of ravenous insect pests. Scientists in Venezuela are more than familiar with the latest insecticides developed in the United States and elsewhere. The farmer is not.

As a consequence, the farmer faces a danger from two directions, both proving more deadly than the insects he wants to control on his farm.

The first danger is the farmer's own ignorance. Many of the newer insecticides are highly poisonous. Unless used properly, they can and do cause death. Each year, from 10 to 15 deaths in Venezuela are reported from the misuse of insecticides. The number of unreported or wrongly diagnosed cases is not known.

At the same time, more than 500 head of cattle die from the misuse of pest controls each year.

The same problem is faced by farmers in the United States, where rigid controls on insecticides are enforced.

The same rigid controls are being applied by Venezuelan scientists, but this is where the second danger becomes an important factor.

The Government recommends to the farmer a particular insecticide for the control of a particular pest on a particular crop.

The insecticide is not as deadly for insects as another, but it is also not as deadly for humans. Along comes a salesman to a small farmer with the more potent and un-recommended insecticide. He sprays some on the insects and they die before the farmer's eyes.

The farmer, in turn, disregards the recommendations of the Government scientists and uses the more powerful insecticide.

This often results not only in the death of the insect pests, but of the farmer too.

To combat these dangers and take the scientist out of competition with commercial interests, the Venezuelan Government is conducting an extensive farmer training program, but it is a long and hard pull. Scientists in Venezuela are optimistic and believe time will beat the insects, ignorance and interests.

each stalk was so badly chewed that it was worthless. Today only five percent, or the safe limit for control, is infested and, Dr. Kern pointed out, the infested stalks can be used.

Science News Letter, December 8, 1956

## PUBLIC HEALTH

## Outbreak of Anthrax Reported in Wyoming

► ANTHRAX, a killing disease that humans can get from animals, has attacked cattle in the Wyoming mountain area, the American Veterinary Medical Association reports.

The epidemic broke out among 11,000 cattle in three national forests this past summer, killing many of the animals. Fortunately, this did not cause any related increase of the disease in humans, the U. S. Public Health Service said.

Anthrax, a disease known for centuries, is caused by a small living organism, *bacillus anthracis*, which usually feeds in animal tissue and causes death by invading the blood stream. It is passed on to man by handling diseased cattle and their products, such as wool, animal hair, hides and skin.

Prevention of the disease in humans centers around suppressing the infection among animals carrying it. Present day treatment for human anthrax includes an antitoxin, sulfonamides and penicillin and other antibiotics.

The Wyoming outbreak was controlled by the burning or deep burial of all infected carcasses. Suspected animal carriers were separated from the rest. In the spring, all animals returning to the forest ranges will be vaccinated.

Science News Letter, December 8, 1956

# Parasite Saves Sugar Crop

► A NATURAL INSECTICIDE has proved to be the only means of saving Venezuela's sugar cane from its worst insect enemy, the sugar cane borer.

The Amazon fly, imported from Brazil's jungles and bred in Venezuela, is the natural insect-killer that is doing the job of controlling the destructive borer.

The fly's larvae, parasites, feed exclusively on the larvae of the sugar cane borer. Scientists at the Center of Agricultural Investigations, Maracay, Venezuela, have put this unique feeding habit to work saving the cane.

Annually, they release controlled amounts of the Amazon flies, bred at the center, in fields infested with the borer. The flies deposit their live young in the borer's tunnels in the cane stalks. The baby flies then proceed to feed on the borers' larvae which have been chewing away at the cane unmolested.

Five years of laboratory tests and field

use have shown that the Amazon fly can control the borer, whereas man-made insecticides fail.

The natural insecticide has proved so effective it almost works too well.

Where the fly is too successful in wiping out a borer infestation, there is an upset in the balance of nature, Dr. Fernando Kern, head of the Center's department of pests and diseases, explained.

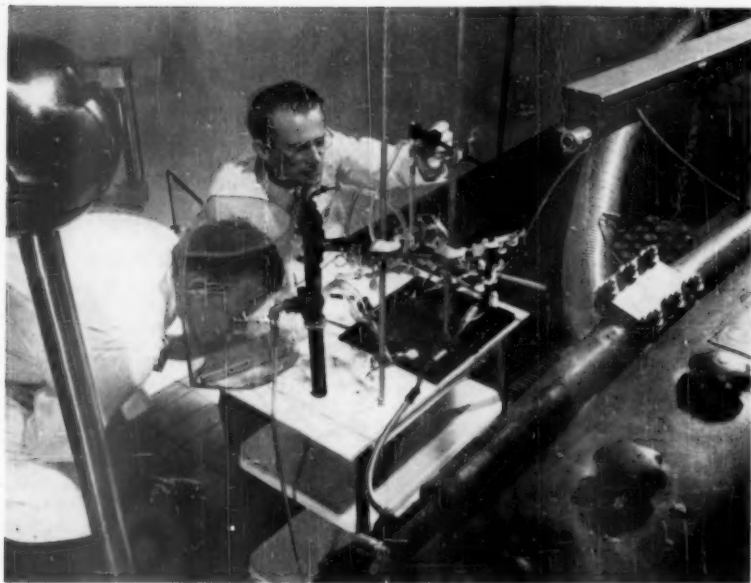
Dr. Kern has found that when the Amazon flies reduce a borer infestation below four percent, there is a borer population explosion the following year resulting in 20% infestation. This is because the fly literally starves itself to death by destroying its own source of food.

Where the borer infestation is kept at five percent, it is an effective control and the borer population does not explode.

In 1949, when the fly was first introduced into Venezuela, 20% of the sugar cane was infested. More important, however,



**BUG-EYED PLATFORM**—Britain's *Gloster Javelin*, all-weather fighter designed as a guided missile platform, is equipped with the latest radar for day and night operation. A tail view of the *Javelin* gives it a bug-eyed appearance.



**AUTO SNIFF BOX**—In studying the odor of diesel exhaust gas, research engineers at General Motors use a plastic "sniff box," since the human nose is still the primary standard for odors. They are attempting to correlate odor intensity with various chemical changes that occur in exhaust gases of an operating diesel.

## BIOCHEMISTRY

## Color Signals Cancer

▶ A BRILLIANT ORANGE-RED color and an intense yellow color signal cancer in a new technique for rapid scanning of smears of cells shed from the body.

The technique is an adaptation of the famous Papanicolaou test for cancer. It is reported by Drs. Ludwig von Bertalanffy and Francis and Marianna Masin of Mount Sinai Hospital and Clinic, Los Angeles, in *Science* (Nov. 23).

The "Papa" test, as it is familiarly called, is a test for detecting cancer by showing cancer cells among others shed or washed from the uterus, lung and stomach. The cells are smeared on a slide, stained and examined through a microscope.

The test is widely used for mass detection of cancer, especially in women.

The Mount Sinai scientists find this test can be speeded by using acridine-orange to stain the cells and then examining them under a blue light. The cells stained this way fluoresce and show brilliantly when examined under the microscope.

Normal cells do not show the same fluorescent colors as cancer cells. White blood cells, for example, show brilliantly white-green nuclei.

Further advantage of the method is that the cell nucleus and the cytoplasm of the cell stain differently. The cytoplasm of a cancer cell shows the brilliant orange-red color, the nucleus an intense yellow fluores-

cence and the nucleolus within the nucleus a brilliant orange-red.

The brilliant colors of the cancer cells show up even under a low power microscope.

Besides its value for speeding cancer detection, the new technique promises, the scientists say, "increased insight" into the cell chemical changes leading to cancer.

*Science News Letter, December 8, 1956*

## HEMATOLOGY

## Find Sugars in Blood Group A Substance

▶ HUMAN BLOOD GROUP A substance has been studied chemically and found to be a nitrogen-containing disaccharide.

Ordinary table sugar and milk sugar belong to the disaccharide class of sugars.

By heating human blood group A substance with acid, scientists at the Lister Institute of Preventive Medicine, London, extracted five disaccharides that contain nitrogen. In further tests, including some with human anti-A serum, the scientists pinned the substance that is blood group A fairly closely to a chemical called O-alpha-N-acetyl-D-galactosaminoyl-galactose.

The studies are reported by Drs. Raymond H. Cote and W. T. J. Morgan in *Nature* (Nov. 24).

*Science News Letter, December 8, 1956*

## HEMATOLOGY

## Normal Blood Standards Called High for Women

▶ THE NORMAL AMOUNTS of red blood cells and hemoglobin expected in the blood are too high for women, Dr. Harriet Emigh Judy, of Spokane, Wash., reported to the American Medical Association clinical meeting in Seattle.

She said that many of her otherwise normal female patients would be considered anemic by present standards.

She tried all the standard treatments for increasing the levels, such as supplying more iron, vitamins, liver and other combinations, but nothing succeeded in bringing the levels up to the accepted value. Yet all other examinations and tests were normal.

After reviewing more than 7,000 women's charts and selecting 663 "normal" ones, she found that blood and hemoglobin counts both were below the accepted standards. Her normals showed a red blood cell count of 4,370,000 and a 12.5 gram hemoglobin level, while the standards are an average of 4,850,000 for red count and 13.8 grams for hemoglobin level.

Dr. Judy said this was the first time a physician with adequately trained laboratory personnel had analyzed consecutive case records to determine what was normal for women, but it will probably take time to change the accepted standards.

Technician Norene Price worked with Dr. Judy in the study.

*Science News Letter, December 8, 1956*

## ASTRONOMY

## Clouds on Venus Are Ground-Up Dust

▶ THE CLOUDS on Venus contain "great amounts of dust, ground off the rocky surface of the planet."

This conclusion concerning the composition of the cloud veil surrounding Venus by Dr. E. J. Opik of Armagh Observatory, North Ireland, disagrees with that of two U. S. astronomers who believe the clouds are water vapor.

Dr. Donald H. Menzel, director of Harvard College Observatory, and Dr. Fred L. Whipple, director of the Smithsonian Astrophysical Observatory, Cambridge, Mass., have reported that the water vapor had not been detected because of Venus' low temperature.

Dr. Opik argues that if the clouds were water vapor, they should be white. Photographic measurements show the cloud veil is distinctly yellow.

The temperature on Venus, Dr. Opik says, is much higher than has been thought. Instead of the very low 38 degrees below zero Fahrenheit recently adopted, Dr. Opik believes that about 111 degrees Fahrenheit is more likely.

This value, given by Dr. Opik in the *Irish Astronomical Journal*, rests on certain assumptions still to be proved, it is reported in *Sky and Telescope* (Dec.).

*Science News Letter, December 8, 1956*

## SURGERY

**"Open Heart" Surgery For Rheumatic Fever**

► A DRAMATIC SURGICAL TECHNIQUE to repair damaged heart valves was reported to the American Medical Association clinical meeting in Seattle.

This new type of "open heart" surgery, pioneered by two Seattle surgeons, makes possible the repair of the heart's mitral valve, the one most often affected by rheumatic fever.

When damaged by disease, the valve will not open or close properly. This either starves the heart for fresh blood or else causes it to be pumped back to the lungs instead of through the body.

Drs. Alvin K. Merendino and Robert A. Bruce, surgeons at the University of Washington School of Medicine, Seattle, who developed the technique, reported that it was effective in correcting both of these conditions.

Up to now, they said, several techniques of blind surgery have been tried without much success. With these, the surgeon cannot see what he is doing inside the heart, but must be guided by his sense of touch.

However, by using the new pump-oxygenator, the Seattle surgeons were able to open up the heart itself and repair the faulty valve. The pump-oxygenator is a mechanical device that takes over the function of the heart and lungs while the heart is being operated.

Although open heart surgery is not new, this is the first report of its use for correcting mitral valve damage, the doctors noted. The operation has been used successfully on only one patient to date, but the physicians said they felt secure in advising it for severe cases for whom there was no other hope for cure.

Science News Letter, December 8, 1956

## MEDICINE

**Report on Brain Stroke Solves 2,400-Year Puzzle**

► THE ANSWER to a 2,400-year-old medical puzzle was revealed when two Los Angeles doctors reported a new type of paralyzing brain stroke at the American Medical Association clinical meeting in Seattle.

Drs. Eliot Corday and Sanford Rothenberg, Cedars of Lebanon Hospital and the University of California at Los Angeles Medical School, said the stroke results when the brain does not receive sufficient blood to function properly because of narrowing cerebral arteries and a drop in blood pressure.

There are at least 12 causes of this cerebral vascular insufficiency, they pointed out, ranging from loss of blood pressure because of heart irregularities to severe hemorrhages anywhere in the body.

Four other types of strokes are recognized by physicians—brain hemorrhage, blood

clot in brain, blood clot that has traveled from the heart to the brain and cerebral artery spasm.

Hippocrates puzzled over the newly-discovered cerebral vascular insufficiency type of stroke more than 2,400 years ago, the doctors said. He found that a patient who had suffered a stomach hemorrhage also suffered brain damage.

The investigators reported that elderly patients who also suffer from hardening of brain arteries are the most likely victims of the stroke. With arteries already narrowed, a drop in blood pressure or hemorrhage elsewhere in the body will further starve the brain of necessary nourishment from the blood.

When this happens, the patient's systemic blood pressure must be promptly restored, the doctors warned, or permanent brain damage may result. This can be accomplished through use of certain drugs or by blood transfusions.

The investigators first demonstrated the new type of stroke in experimental animals and have found some cases in humans.

Science News Letter, December 8, 1956

## BIOCHEMISTRY

**See Disease Weapons From Germ Reversals**

► DISCOVERY of some germ-reversing chemicals by Dr. Werner Braun of Rutgers Institute of Microbiology, New Brunswick, N. J., is expected to lead to "an entirely new means of controlling disease."

The germ reversal Dr. Braun accomplished by chemicals consists in making laboratory-grown germs change from non-disease-producing ones to virulent disease producers.

The chemicals causing this change are breakdown products of the cell nucleus chemical, DNA, short for deoxyribonucleic acid. One of these is kinetin.

Antagonists to such chemicals, if found, would be the expected new weapons against germs, changing virulent to harmless germs.

Science News Letter, December 8, 1956

## TECHNOLOGY

**Roads Unnecessary for Heavy Cargo Vehicle**

► A TRUCK-LIKE VEHICLE that can haul heavy 35-ton loads over rough, roadless country, even through sand, snow, mud or underbrush, is now being put to work in the undeveloped areas in the world.

Built by R. G. LeTourneau, Inc., at Longview, Tex., the Transporter has a d.c. electric motor geared directly to each wheel. If one of the gigantic six-foot tall tires loses traction, the other wheels take over the power.

Braking is accomplished by a regenerative or feedback action of the motors that turns them into generators. The engine is 335 horsepower diesel.

Science News Letter, December 8, 1956

**IN SCIEN**

## VITAL STATISTICS

**Cancer Death Rate Down For Women, Up for Men**

► THE CANCER DEATH RATE for women in middle life has dropped 13% over the last 10 years, but for men it has risen somewhat, statisticians of the Metropolitan Life Insurance Company in New York report.

Among the company's millions of industrial policyholders, this 13% drop was shown by women between the ages of 45 and 64, and is attributed to earlier detection and prompt treatment by surgery or radiation. An even greater drop is shown in the death rate from uterine cancer at these ages. The death rate is now only two-thirds as great as ten years ago.

For middle-aged men, however, the statistics show an increase in the cancer death rate. This was due mainly to higher mortality from cancer of the lungs, mouth and throat, stomach and urinary organs.

Science News Letter, December 8, 1956

## ARCHAEOLOGY

**Find Tools in Mexico Like Those in Arizona**

► AN ANCIENT DESERT PEOPLE who originally could not grow their food but lived on seed gathered in the wild have been found to have lived not only in Arizona and New Mexico but probably also as far south as central and southern Mexico.

Ancient stone tools like those of the Cochise people, formerly believed to live only in the Arizona area, were found in Mexico by Dr. George E. Fay of the Southern State College, Magnolia, Ark.

Particularly interesting was the find of fragments of two metates, stone vessels in which ancient Indians ground their corn.

The fragments point to two milling methods. The Cochise-like people used a shallow basin made of granite and also a thin, flat slab of shale. Also found were numerous one-handed, asymmetrical bifaced manos, the stone tools with which the corn or seeds were pounded and ground on the metate.

Earliest use of corn by the Arizona Cochise people has been dated at about 2000 B.C.

The stone tools found in Mexico were gathered from the surface of the ground in an effort to salvage all the available archaeological material before farmers' plows turn them under or scatter them.

Dr. Fay plans to excavate several of the more important sites he located in Mexico. The digging is scheduled to begin in 1957, he reports in *Science* (Nov. 23).

Science News Letter, December 8, 1956



## THE FIELDS

### GEOPHYSICS

## Sodium Reactions Add to Night Sky's Faint Glow

► THE NIGHT SKY'S faint glow is due to a process involving sodium vapor, a first-of-its-kind experiment at Holloman Air Development Center, Alamogordo, N. M., has shown.

By throwing sodium vapor from a high-flying rocket, scientists of the Air Research and Development Command verified that the night sky glow not caused by moonlight and starlight is due to photochemical reactions in the upper air.

Sensitive instruments can detect the night-glow characteristic of sodium.

Previous rocket flights have been used to study sodium behavior at twilight. Then the sodium vapor, ejected from a rocket at high altitudes, was still in the direct rays of the sun. This year's November flight, however, was made at night.

When the rocket reached an altitude of 30 miles, the sodium vapor was released, and the ejection continued until the rocket had reached a peak of 85 miles and returned to 45 miles above the earth. Four pounds of sodium were distributed along the rocket's trajectory.

The chemical caused a yellow trail clearly visible to the eye in the region from 30 to 60 miles high in both the upward and downward path of the rocket. Above 60 miles, there was no visual effect.

Science News Letter, December 8, 1956

### MEDICINE

## High Lung Cancer Rate Confirmed for Smokers

► SMOKE a pack a day and your chances of dying from lung cancer are 14 times higher than they are if you do not smoke. Smoke two packs a day and your chances are 27 times higher.

These are the findings of the American Cancer Society's survey of cigarette smoking and lung cancer, released in a pamphlet designed for widespread distribution.

The American Cancer Society has no plans for a campaign against smoking, according to the report. To quit smoking or not is still a question the individual smoker must settle in consultation with his doctor.

"The American Cancer Society will continue to support research efforts to find out whether one or more substances in cigarettes, industrial fumes, gasoline and diesel engine exhausts, in dust from asphalt or bituminous roads, etc., actually cause lung cancer in man," the report states.

Here are other findings of the four-year study:

All heavy smokers do not get lung cancer.

How smoking will affect any one person in particular cannot be predicted.

Smokers living in the city have a somewhat higher death rate from lung cancer than those living in the country.

Regular smokers have a death rate from all causes 52% higher than that for non-smokers. Lung cancer and heart disease account for most of this difference.

These results are based on a survey started in 1952 and covering 188,000 men between 50 and 70 years of age. Those questioned were selected from nine states from coast to coast, and included smokers and non-smokers from both urban and rural areas.

Although only men between 50 and 70 were surveyed, the report states there is no reason to believe other groups are not affected in the same way.

For pipe smokers and cigar smokers the survey did not show any definite trends. Pipe smoking appeared to have a much smaller relationship to lung cancer deaths than did cigarette smoking, while cigars seemed to have none at all.

The reasons why there is a smaller relationship are still unknown.

Science News Letter, December 8, 1956

### BIOCHEMISTRY

## Study Pituitary Gland for Light on Stress Reaction

► KNOWLEDGE of how the powerful pituitary gland in the head reacts when a person is under stress is expected from studies reported by Drs. A. R. Currie and B. Cruickshank of the University of Glasgow, Scotland, and Drs. J. B. Dekanski and L. G. Skinner of Organon Laboratories, Newhouse, Lanarkshire, Scotland, in *Nature* (Nov. 24). An effect on the thyroid gland in the neck seems likely.

From 12 human pituitary glands taken from adults after death, these scientists have extracted the pituitary hormone which influences the thyroid gland. This big U-shaped neck gland is best known in connection with goiters.

None of the 12 dead persons had suffered any disease of the thyroid gland.

The average pituitary gland of an adult, the scientists found, stores about two International Units of thyroid-stimulating hormone, or about half the amount excreted per day by some patients with underactive thyroid glands.

This thyroid-stimulating hormone and also a hormone that stimulates the adrenal glands are believed to be produced by basophil cells of the pituitary gland.

The adrenal glands also produce epinephrine, or adrenalin, and are the glands that help the body meet stress.

If the two pituitary hormones that stimulate both thyroid and adrenals are produced by the same cells in the pituitary, the degranulation change found in these pituitary cells during stress must, the scientists suggest, have some influence on the yield of stored thyroid-stimulating as well as other stored hormones.

Science News Letter, December 8, 1956

### MEDICINE

## Strawberry Mark Off Without Disfigurement

► THE STRAWBERRY MARK, or nevus, of babies is a benign or non-cancerous tumor of artery origin that can be removed without disfiguring surgery.

First proof of this is announced by the American Cancer Society, reporting work by Drs. Thomas S. Walsh Jr. of St. Peter's Hospital and Victor N. Tompkins of the New York State Department of Health, both in Albany, N. Y.

Contrary to traditional belief, the condition estimated to afflict one of every 10 or 12 babies is not congenital.

A survey of 4,892 deliveries in local obstetrical hospitals failed to disclose a single incidence in which the tumor was present at birth. The parents usually notice it from one to six weeks later.

The strawberry nevus may appear anywhere on the surface of the body. In the majority of instances, it completely disappears within a few months. Occasionally, it shows rapid and extensive growth.

The Albany scientists showed that rapid and extensive growth occurs only when the tumors overlie certain normal arteries. The sites of the vessels are constant and predictable.

The report is based upon the treatment of 192 children with 281 tumors between January, 1949, and December, 1954.

The small growths did not need treatment, but their disappearance could be hastened by the application of dry ice.

The large growths required an interruption of the blood supply from the solitary feeding artery. This was achieved usually by injecting a sclerosing or hardening drug into or about the artery. In cases where injection failed, closing the feeding artery at operation was sufficient to prevent further growth and initiate regression.

Science News Letter, December 8, 1956

### NUTRITION

## Milk, Packed and Frozen, Stays Good for One Year

► MILK can be frozen in plastic bags and stored for as long as 12 months.

Studies at Britain's National Institute for Research in Dairying show that milk packaged and frozen in pint, quart and gallon polythene packs, when melted a year later, "cannot be distinguished from pasteurized milk."

British dairy scientists are also using radioactive isotopes to try and discover how cows make milk. They add the atomic isotopes to materials fed cows, then trace them through to the milk produced.

Results to date show that milk fat is made from the acetate and fat circulating in the animal's blood. Further research is expected to pinpoint the production in the cow of the protein and lactose content of milk.

Science News Letter, December 8, 1956

## ARCHAEOLOGY

# Reversing Corrosion

**Chemical method for restoring copper after it has crumbled to dust makes it possible to unroll ancient documents and thus reveal the secrets of the past.**

By MARJORIE VAN DE WATER

► A DEAD SEA SCROLL, embossed on copper, carried hidden in its rolls directions for finding a buried treasure that may not exist.

For more than 2,000 years this tight little roll of metal lay corroding in a cave near the Dead Sea. The desert's dry sandy winds blew into its hiding place. The metal crumbled to dust. Besides the dust, only a cement-like crust remained.

When it was discovered, scientists were searching for archaeological riches after the first sensational Dead Sea scroll had set off a wave of religious interest and speculation.

Instead of the sheepskin or papyrus of the first finds, this roll of ancient embossed letters was of the supposedly more lasting metal. Yet it seemed undecipherable because it was impossible to unroll the brittle crumbling metal.

Because scientists were so eager to read the hidden words in the scroll, a Baltimore chemist developed a new method to undo nature's destruction. He found a way to restore such corroded copper to its original condition so that it could be unrolled and handled and read.

Most of the large collection of Dead Sea scrolls discovered in their cave hiding places were written on leather in ancient Hebrew or Aramaic letters. Later, tightly rolled, they were hidden near an ancient monastery in Qumran.

## One Scroll on Copper

However, this one scroll, of particular interest, was embossed on what had been originally a single strip of impure copper.

When found, it was in two parts so badly corroded the original metal had completely disappeared and was replaced with oxides and salts. The rolls were filled with dust. They were cracked and, in some places, they were broken. The lightest touch would cause them to crumble apart.

The problem that faced scientists was how to unroll this time-ruined roll and unlock for present generations its secrets of the distant past.

Archaeologists, paleographers, Old and New Testament scholars and language experts had combined forces on deciphering the leather scrolls. It was found that some were precious early editions of books of the Old Testament.

Some were records and rules of discipline of an ancient Hebrew monastic order called the Essenes, of whom extremely little was known. This was the order that had oc-

cupied the monastery near which the scrolls were found.

Dating by radiocarbon and other archaeological means showed that some, at least, dated back to the second century B.C. or possibly even as far back as the fourth century B.C. As they were deciphered, the scrolls proved to be of the utmost importance both to Bible scholars and archaeologists.

This information made the tightly wrapped copper scroll even more of a challenge.

Working with a grant from the American Philosophical Society, Dr. Alsoph H. Corwin, Johns Hopkins University chemist, undertook an attempt to find a way to treat the crumbling metallic dust of the scroll in order to restore the original copper so that it could be unrolled and manipulated without breaking up and without loss of the embossed letters.

Associated with Dr. Corwin in the work were R. Subramanian and Joseph A. Walter.

Dr. R. J. Gettens of the Freer Gallery of

Art in Washington, formerly chief of technical research at the Fogg Art Museum at Harvard, had already developed a method for unrolling one of the leather scrolls so brittle it had defied inspection for years.

Dr. Gettens had some tiny fragments that had broken off the copper scroll. These bits he furnished to Dr. Corwin to serve as samples for his experiments.

Seeing how tiny were the samples, Dr. Corwin realized it would be necessary to make up models for his research that would duplicate in the laboratory the effects of thousands of years in the soil of a Qumran cave.

## Three Methods Tried

He tried three methods for preparing such a model.

First he tried electrolytic corrosion. That did not work because the convection currents in the electrolyte made it difficult to preserve the embossed letters.

Next he tried gaseous corrosion. This appeared to be working, but it soon was evident that this method would be too slow. He had only a few months for the challenging job.

What he finally decided on was to make up a cuprous oxide paste containing im-



**METAL RESTORED**—Dr. Alsoph H. Corwin, Johns Hopkins University chemist, at work on a new method for restoring crumbling mass of copper oxide to the original copper with embossed letters intact. Insert shows strips of copper oxide paste, made by Dr. Corwin to duplicate condition of the scroll, on which he made his experiments.

purities similar to those of the original. He made his paste stiff enough so that he could form it. Then he dried it so that he could use it for his restoration studies.

Next step was to compare the actual chemical composition of the original scroll with that of his model. Dr. Corwin found the composition of the corroded scroll by microchemical analysis.

He found that he could duplicate it best by wetting his cuprous oxide paste strip with a solution of cupric chloride. This was found to act as an excellent cementing agent for the strip giving it a physical strength much more like the original scroll.

Now he was ready to try to restore his model strip to the original copper. After experimenting with various materials, Dr. Corwin found that the best way to restore the metal was to put the corroded model into an atmosphere of hydrogen. The strength of the restored metal, he found, could be improved by wetting again with the cupric chloride solution and repeating the exposure to hydrogen.

Now he would have been ready to try out the method on the scroll.

### Scroll Not Available

Unfortunately, however, the scroll was not in this country. And, in the meantime, it had already been opened in England by sawing it into segments.

The scientist who did the work there was Dr. H. Wright Baker, professor of mechanical engineering at the college of technology at the University of Manchester. Dr. Baker's method was also, in part, a chemical process.

After a superficial cleaning of the outside of the roll with dental instruments and polishing brushes, Dr. Baker applied a resin

coating and baked it in an electric oven for a few hours at 40 degrees Centigrade. Now it was tough and could be safely handled.

Then, using a special saw less than two inches in diameter and only 0.006 inch wide, Dr. Baker cut the scroll into small segments that could be lifted off.

In some cases, he found that a stony material had formed from the desert dust blown into the roll in the cave. This acted as a cement to fasten adjoining layers together. Where this occurred, the layers were cut or forced apart. Patches of corrosion products were cut away with dental drills.

### No Letters Lost by Cutting

Of more than 3,000 letters on the scroll, only five percent were missing and an additional two percent were not clear. However, none of these were lost in the cutting, because it was possible in each case to make the cut in blank spaces between columns.

The message which was revealed, when all the segments had been transcribed and translated, proved to be the directions for finding buried treasure—the oldest such document ever found.

The treasure itself, if it really exists, has not yet been unearthed, however.

Another achievement by Dr. Corwin of

more immediate practical interest to archaeologists and museum directors was development of an electrolytic method for restoring ancient corroded bronzes.

Sodium hydroxide, used previously as the electrolyte for such cleaning, left a residue of stannic oxide in the pores of the restored bronze object, Dr. Corwin found. This residue was not only dulling, but harmful, because it would later adsorb corrosive chemicals and so cause future corrosion.

Experiment showed Dr. Corwin that following the alkaline restoration with repeated electrolysis, using a sulfuric acid solution as electrolyte, did away with the residue and greatly improved the appearance of the object.

Then a final polishing treatment done in an electrolyte of phosphoric acid, dioxane and water left the bronzes bright and relatively resistant to future corrosion.

The cleaning time was only about 15 minutes. And no arduous hand cleaning at all was required.

Science News Letter, December 8, 1956

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# Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1779 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

**ANCIENT AND MODERN MAN IN SOUTHWESTERN ASIA**—Herby Field—*University of Miami Press*, 342 p., illus., paper \$7.50, cloth \$8.50. About the 65,000,000 people of the Near East, or Middle East, news center of the present, which includes Sinai, Israel, Jordan, Lebanon, Syria, Turkey, the Caucasus, Iraq, the Arabian Peninsula, Iran, Afghanistan and Baluchistan.

**THE ANCIENT MAYA**—Sylvanus Griswold Morley, revised by George W. Brainerd—*Stanford University Press*, 3d ed., 494 p., illus., \$10.00. A doubly posthumous volume. After Dr. Morley's death, Dr. Brainerd undertook to revise the text for a new edition. Then Dr. Brainerd himself died in 1956 and the revision was completed by Betty Bell.

**ATOMIC ENERGY FOR YOUR BUSINESS: Today's Key to Tomorrow's Profits**—Arnold Kramish and Eugene M. Zuckert—*David McKay*, 269 p., illus., \$3.95. Through the smoke and radioactive dust of Hiroshima and through the word-clouded atmosphere of the first atomic decade, the bright hope of peaceful atomic energy still shines and brightens, the authors say.

**CEMENT AND CONCRETE REFERENCE BOOK 1956-1957**—*Portland Cement Association*, 112 p., illus., paper, free upon request direct to publisher, 33 West Grand Avenue, Chicago 10, Ill. Data on this industry assembled from authoritative sources.

**FACTS CONCERNING URANIUM EXPLORATION AND PRODUCTION**—John E. Crawford and James

Paone—*Govt. Printing Office*, Bureau of Mines Handbook, 130 p., illus., paper, 70 cents. A brief and concise report intended to answer the large number of questions received from the public about uranium prospecting and handling.

**GAS-PHASE CHROMATOGRAPHY**—John R. Lotz and Charles B. Willingham—*Mellon Institute*, 5 p., illus., paper, free upon request direct to publisher, 4400 Fifth Avenue, Pittsburgh 13, Pa. Description of a simple and rapid method for separating nearly any mixture whose components have appreciable vapor pressures. Necessary apparatus is simple and inexpensive.

**MAN OF HIGH FIDELITY: Edwin Howard Armstrong, a Biography—Lawrence Lessing—*Lippincott*, 320 p., illus., \$5.00. The story of the life, and its unhappy end, of the inventor of FM static-free radio and many other advances in radio.**

**NASSER'S HIGH ASWAN DAM: Panacea or Politics?**—Morris Llewellyn Cooke—*Public Affairs Institute*, 28 p., paper, 25 cents. The handling of the financing of this ambitious project is considered to have triggered the Suez crisis. The author of this report was the first director of REA.

**QUALIFICATIONS AND OPPORTUNITIES FOR CAREERS IN ASTRONOMY**—*American Astronomical Society*, 5 p., paper, \$3.00 per 100 copies. How to advise students interested in astronomy, and what students to steer toward this profession.

**PERSPECTIVES IN ORGANIC CHEMISTRY**—Sir Alexander Todd, Ed.—*Interscience*, 527 p., illus., \$7.50. A volume of essays covering a wide range of subjects gathered together to honor the 70th birthday of Sir Robert Robinson. Much of the text is in German.

**A RAPID MATCHING TECHNIQUE FOR SEMI-QUANTITATIVE SPECTROCHEMICAL ANALYSIS**—Edwin S. Hodge and William K. Baer—*Mellon*

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STANDARDIZATION AND INSPECTION OF FRESH FRUITS AND VEGETABLES—Raymond L. Spangler—Govt. Printing Office, USDA Miscellaneous Publication No. 604, 32 p., illus., paper, 15 cents. Most of nearly 700,000 cars of fresh fruits and vegetables shipped annually by rail to city markets are bought and sold on the basis of official standards and more than half are inspected.

STORMY LIFE: Memoirs of a pioneer of the Air Age—Ernst Heinkel, edited by Jurgen Thorwald—Dutton, 256 p., illus., \$5.00. The autobiography of a German aircraft designer.

THE STRESS OF LIFE—Hans Selye—McGraw-Hill, 325 p., illus., \$5.95. An authority explains for the layman what scientists have learned about stress as it occurs in daily life, whether from crossing the street at a busy intersection, exposure to a draft, or even sheer joy.

A TECHNOLOGY FOR THE ANALYSIS, DESIGN, AND USE OF TEXTILE STRUCTURES AS ENGINEERING MATERIALS—Walter J. Hamburger—American Society for Testing Materials, 50 p., illus., paper, \$1.50. A philosophical discussion of the development of this technology.

THE TESTIMONY OF THE SPADE—Geoffrey Bibby—Knopf, 424 p., illus., \$6.75. An archaeologist writes for the layman the story

of our ancestors in northern Europe before the dawn of history.

THINGS: A Volume of Objects Devised by Man's Genius Which Are the Measure of His Civilization—Geoffrey Grigson and Charles Harvard Gibbs-Smith, Eds.—Hawthorn, 466 p., illus., \$10.00. An encyclopedia of inventions from acolian harp to zippers.

THINGS MAPS DON'T TELL US: An Adventure Into Map Interpretation—Armin K. Lobeck—Macmillan, 159 p., illus., \$4.95. This book not only shows us features of the land and water masses, but provides explanations of how these things came to be—how the long peninsulas of Florida, Denmark and Long Island were formed, for example.

WEBSTER'S ELEMENTARY DICTIONARY—G. &

C. Merriam, 579 p., illus., \$3.75. Prepared especially for students in grades four to six and containing over 18,000 words. The clear type and attractive drawings will help children.

WING THEORY—A. Robinson and J. A. Laumann—Cambridge University Press, 569 p., \$13.50. Dealing with the calculation of the aerodynamic forces that act on the lifting surfaces of an airplane in flight.

YOUR CHILD'S SPEECH: A Practical Guide for Parents for the First Five Years—Flora Rheta Schreiber—Putnam's, 256 p., \$3.50. Stressing the importance for the child of having pleasant voices to imitate. This not only prevents speech defects but also harsh, shrill, bellowing or unmusical speech.

Science News Letter, December 8, 1956

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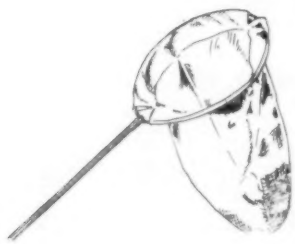
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This scope price does not include the tripod, eyepieces, etc. Free with microscope above.

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**NEW NAVY 6 POWER SCOPE**

A remarkable Navy Surplus Bargain. Originally designed as an Azimuth Telescope which mounted above the Gyro Compass, Has approx. 6 POWER. Finest Quality fully coated lenses. Crosshair reticle. Adjustable eyepiece, A Sun Filter and a lens holder. A Hose filter, New cond. Cost Gov't \$150.00

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Here's a real optical bargain. Manufactured by Wollensak for the U.S. Navy, Bureau of Ships. A 10 POWER "Officer of the Deck" Spyglass. Has top quality, fully coated, precision ground lenses. Adjustable eyepiece. Overall lgh., 22 1/2". Comes in a hardwood case with brass hinges and locks.

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**NEW EASTMAN 178MM AERO EKTAR f/2.5 CAMERA LENS WITH 7" FOCAL LGTH.**

Originally designed for use on the K-21 and K-24 Aerial Cameras. A genuine EASTMAN AERO EKTAR, 178mm lens. Has f-stops from 2.5 to 16. Focal length is 7". This amazing lens is NEW - in original con. Guaranteed perfect condition. Excellent for Color or Black & White. Exceptionally fine for night work or in poor light conditions. Comes with 2 filters - 1 Polarized for haze, etc., and one yellow. Also included is a filter adapter, a lens holder for high altitudes and a lens dust cap. Can be adapted to 35mm or Speed Graphic Cameras as a telephoto lens.

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**NEW 9" NAVY PROJECTOR LENS**

Originally used as a Motion Picture Projector Lens. Contains the very finest coated, optical lens in a precision machined, stainless steel barrel. Has a 9" focal length. Lens diameter is 1 1/2". Ideal for use on a 35mm Slide Projector or for larger 2 1/4"x 2 1/4" to 4"x 5" transparencies.

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## NATURAL RESOURCES

## Desert Water Saved by Whales

➤ MILLIONS OF GALLONS of water will be saved during the Australian hot summer—November to March—in the arid areas by whales.

The Commonwealth Scientific and Industrial Research Organization has found a way of cutting down water evaporation.

Cetyl alcohol, a chemical extracted from whale oil, is used to lay a film over the surface of water. It restricts the water escaping to the air, but does not stop oxygen entering the water and keeping it fresh.

Cetyl alcohol is invisible and tasteless, and will be used freely in dams and reservoirs. It is harmless to animal life.

In ideal laboratory conditions the chemical cuts evaporation by 80%. Trials over the past two years in dams and reservoirs have shown a saving of between 20% and 70%.

Much of Australia's pastoral belt has a normal water evaporation rate of eight feet a year—often more than a year's rainfall. Scientists have been working to beat evaporation for the last 16 years.

Science News Letter, December 8, 1956

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To People  
who want to write  
but can't get started

DO YOU have that constant urge to write but fear that a beginner hasn't a chance? Here is what a famous editor said:  
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The Newspaper Institute of America offers a FREE Writing Aptitude Test. Its object is to discover more men and women who can add to their income by fiction and article writing. The Writing Aptitude Test is a simple but expert analysis of your latent ability, your powers of imagination, logic, etc. Those who pass this test are qualified to take the famous N. I. A. course based on the practical New York Copy Desk Method which teaches you to write by writing. You work at home, in leisure time, constantly guided by experienced writers. Soon you acquire the coveted "professional" touch. Then you are ready to market your stories, articles and news items.

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## Do You Know?

A *silicone* coating applied to laboratory glassware dries as a clear hard skin that is resistant to acids and organic solvents.

In spite of toothpastes, fluorine and scientific advances, *tooth decay* remains one of mankind's most prevalent diseases.

The island of St. John, Virgin Islands, is noted for its near-perfect *climate* with an average annual temperature of about 78 degrees Fahrenheit, and a difference of only about six degrees between winter and summer.

Synthetic *gems* are superior to real gems for industrial use because they are perfect.

A special type of ground glass has been developed to furnish *potassium* to plants slowly and for prolonged periods.

## Questions

ASTRONOMY—What is suggested composition of clouds on Venus? p. 359.

☐ ☐ ☐

HEMATOLOGY—Why might many otherwise normal women be considered anemic? p. 359.

☐ ☐ ☐

MEDICINE—What is anaphylactic shock? p. 357.

☐ ☐ ☐

PUBLIC HEALTH—How is anthrax passed from animals to man? p. 358.

☐ ☐ ☐

VITAL STATISTICS—What changes have occurred in cancer death rates during the last ten years? p. 360.

☐ ☐ ☐

Photographs: Cover, Marine Studios; p. 355, Fremont Davis; p. 357, Cornell University; p. 358, British Information Services; p. 359, General Motors Corporation; p. 362, Alsop H. Corwin; p. 368, Eastman Chemical Products, Inc.

### MEDICINE

## No Help for Colds in Citrus Chemicals

► CITRUS PEEL CHEMICALS, called bioflavonoids, do not, contrary to a recent report, prevent or shorten the course of common colds or make the sufferer more comfortable, five doctors report on the basis of two separate studies.

These latest, unfavorable reports appear in the *Journal of the American Medical Association* (Nov. 24). They are from Drs. Warren L. Franz and Henry L. Heyl of Dartmouth Medical School and the Hitchcock Foundation, Hanover, N. H., and Drs. Harry E. Tebrock, New York, Joseph J. Arminio, Ossining, N. Y., and John Howard Johnston, West Hartford, Conn.

Science News Letter, December 8, 1956

The 1956 fall census showed 588 *trumpeter swans* in the American flock at Red Rock Lakes Refuge and national parks and forests nearby.

Australian *eucalyptus* trees are adaptable to a wide range of soil conditions, temperatures and altitudes, and have great value in soil-fixation programs and as shelter belts.



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is 550 to 1600 kc. Its small size (2 3/4 in. long, 1 3/4 in. wide and 3/4 in. thick) and weight (2.5 oz. with batteries) make it well suited for wearing on the wrist or in a shirt pocket. Completely assembled with all batteries.

## Wrist Radio Weighs 2.5 oz.

### All-transistor wrist radio receiver

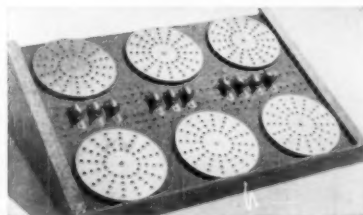
A broadcast band all-transistor wrist radio has been designed with r-f reflex circuit to provide good selectivity and sensitivity. Three transistors are used which require 4.5 ma total battery current and five button-size mercury cells last up to 100 hours. The receiver features a 2-stage transformer-coupled audio amplifier and a no-whistle regenerative circuit. A high quality hearing aid receiver allows for private listening. Printed circuitry is used throughout. Band coverage

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Control panel of GENIAC set up to do a problem in space ship engineering

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You will find building and using GENIAC a wonderful experience; one kit user wrote us: "this kit has opened up a new world of thinking to me." You actually see how computing, problem solving, and game play (Tic-tac-toe, nim, etc.) can be analyzed with Boolean Algebra and the algebraic solutions transformed directly into circuit diagrams. You create from over 400 specially designed and manufactured components a machine that solves problems faster than you can express them.

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will find these excellent demonstrators of circuitry, solutions in symbolic logic, theory of numbers, cybernetics, and automation.

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Send for your GENIAC kit now. Only \$19.95 with over four hundred components and parts, fully illustrated manual and wiring diagrams. We guarantee that if you do not want to keep GENIAC after one week you can return it for full refund.

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# • New Machines and Gadgets •

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 860. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

❁ **BARBECUE GRILL BRUSH** is designed specifically for cleaning away charred food or grease left after a cook-out. It has crimped wire bristles and a steel scraper set solidly in a black plastic handle. Bristles are flared so they can reach into corners and around grill rods to do a thorough cleaning job.

Science News Letter, December 8, 1956

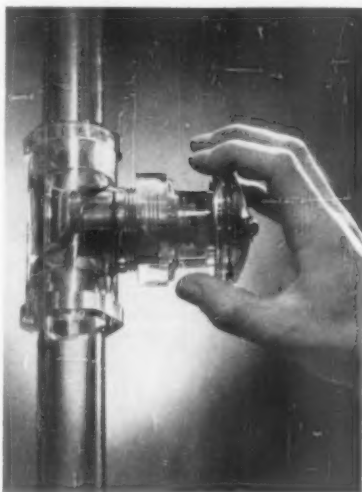
❁ **FLASHLIGHT BRACKET** for cars is an adjustable holder mounted on the bottom inside edge of the dashboard. It pivots in the center, permitting the bracket to be swung up behind the panel out of sight. Designed to fit any make, model or year of car, the holder will take any standard flashlight.

Science News Letter, December 8, 1956

❁ **SOLUBLE SOLIDS GAGE** is a combination hand and dipping refractometer designed for precise and rapid determination of total soluble solids in juices, jams, syrups and other food products. The small, lightweight instrument has a thermometer, reading from 10 to 40 degrees centigrade, recessed in the prism mounting.

Science News Letter, December 8, 1956

❁ **GLOBE-TYPE VALVE** is described as never rusting and being corrosion resistant to "problem" chemicals. Made of a butyrate plastic, the valve's interior surfaces are



smooth for unimpeded flow. When closed, a plastic-to-plastic seal is formed. Flow can be watched through the transparent valve, shown in the photograph.

Science News Letter, December 8, 1956

❁ **SUEDED LATEX GLOVES**, particularly useful for those who handle chemicals, have an inner finish that helps to cut down

perspiration and makes them easier to pull on and off, thus increasing their lifetime. The velvety sueded inner finish is vulcanized on latex and does not require powder.

Science News Letter, December 8, 1956

❁ **BOTTLE RESEALER** has an automatic push button release that holds and releases bottle caps at a touch. It can be used to re-seal bottles factory-tight with the original cap. Made of heavy duty chrome finish with a plastic grip in various colors, the kitchen device comes complete with a magnetic wall mount.

Science News Letter, December 8, 1956

❁ **VOLTAGE TESTER** will check unknown voltages from 65 to 800 volts, a.c. or d.c. Clip-on leads leave the hands free for other work when using this direct-reading device with which open lines or blown fuses can be traced or electrical appliances checked.

Science News Letter, December 8, 1956

❁ **ALUMINUM OIL FILTER** may be changed in minutes without tools as easily as changing a light bulb, its maker states. A spring-loaded valve in the filter's inlet openings immediately seals the used unit when it is spun out of its seat, thus eliminating the dirt problem. A production item on at least one 1957 car, the quick-change filter can be installed on all current models.

Science News Letter, December 8, 1956



## Nature Ramblings



➤ **FROM EARLIEST** Colonial days, deer have been regarded by Americans with more affection than almost any other form of wildlife.

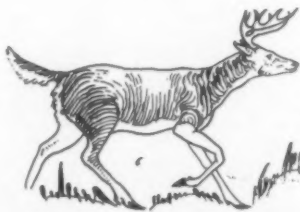
Not only poets, but the hunters who sought deer have praised their delicate beauty, quiet dignity and grace of movement.

The Indians were dependent upon deer. They gave him his venison and pemmican for food, hides for warmth on winter nights, buckskin for clothing and antler-pieces for tools and ornaments.

Fat is a good index to the general physical condition of deer in the winter. The less fat you find on a wintering deer, the nearer he is to starvation.

Deer come to the beginning of winter with considerable reserves of fat, stored in various parts of their bodies during their long summer of browsing. The carcass of a deer shot in autumn will have a layer

### Deer



of fat under almost all parts of its skin, with thicker masses on hips, saddle and elsewhere.

There will be a great deal of fat around the internal organs, even a spot of fat on the heart. The marrow in the long bones will be white with fat.

As the summer browse-plants are ban-

ished by the onset of winter, the deer turns to less appetizing and less nourishing foods. The may fill the stomach, but they make no fat—and the animal begins to use up its reserves.

First to go are the outside layers and masses of fat—the deer loses its late-summer roundness, becomes more angular in outline.

Later in winter, especially if the snows are deep and even winter browse is hard to get at, the hunger-pinch becomes more severe and the internal reserves are drawn upon.

The carcass of a winter-killed deer will show very little visceral fat; and if the fat spot on the heart is gone, it is a pretty sure sign that the animal was really starving.

Indication of extreme distress is the disappearance of fat from the bone marrow. Deer in the final stages of malnutrition will have nothing in the long-bone cavities but a kind of red jelly.

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